

What is claimed is:

1. A method of controlling a process of fabricating integrated devices on a substrate, comprising:
 - measuring at least one pre-etch dimension and at least one post-etch dimension of at least one structure on the substrate; and
 - adjusting a process recipe of an etch process for etching the substrate and a process recipe of at least one pre-etch process and/or at least one post-etch process using the results of measuring the dimensions on the structures.
2. The method of claim 1 further comprising executing a multi-pass process wherein the substrate is processed more than once by an etch process and at least one pre-etch process and/or at least one post-etch process while forming the at least one structure.
3. The method of claim 1, wherein the measuring step further comprises:
 - detecting a failure of processing equipment performing the at least one pre-etch process and/or the at least one post-etch process.
4. The method of claim 1, wherein the structures are selected from a group consisting of a blanket layer, a featured layer, a film stack having at least one blanket layer and a film stack having at least one featured layer.
5. The method of claim 1, wherein the measuring step uses a non-destructive measuring technique.
6. The method of claim 1, wherein the measuring step uses at least one in-situ measuring tool that is a component of an etch reactor performing the etch process.
7. The method of claim 6, wherein the measuring step further comprises:
 - measuring thickness of the structures using the at least one in-situ measuring tool.

8. The method of claim 1, wherein the measuring step uses at least one ex-situ measuring tool that is external to an etch reactor performing the etch process.
9. The method of claim 8, wherein the measuring step further comprises:
measuring topographic dimensions and/or thickness of the structures using the at least ex-situ one measuring tool.
10. The method of claim 9, wherein the at least ex-situ one measuring tool and the etch reactor are modules of a processing system.
11. The method of claim 1, wherein the processing equipment is external to the processing system.
12. The method of claim 1, wherein the adjusting step further comprises:
adjusting the process recipe of an etch process for etching at least one subsequent substrate.
13. The method of claim 1, wherein the at least one pre-etch process is performed before measuring the pre-etch dimensions.
14. The method of claim 1, wherein the at least one post-etch process is performed after measuring the post-etch dimensions.
15. The method of claim 1, wherein the at least one pre-etch process and/or the at least one post-etch process is selected from a group consisting of a chemical mechanical polishing process, a deposition process, an etch process, an oxidation process, an annealing process and a lithographic process.
16. The method of claim 1, wherein the pre-etch measurements are taken in a device coupled to a processing system having a processing chamber in which the etch process is performed.

17. The method of claim 1, wherein the pre-etch measurements are taken in a device remove from a processing system having a processing chamber in which the etch process is preformed.
18. The method of claim 1, wherein the step of adjusting further comprises adjusting end point detection parameters.
19. The method of claim 1 wherein the at least one structure is a capacitive structure of a trench capacitor on a substrate.
20. The method of claim 19, wherein the capacitive structure comprises a polysilicon electrode layer.
21. The method of claim 20, wherein the process recipe of the etch process further comprises:
providing HBr and Cl₂ at a flow ratio HBr:Cl₂ in a range from 1:15 to 15:1.
22. A computer-readable medium containing software that when executed by a computer causes a semiconductor wafer processing system to control a process of fabricating integrated devices on a substrate using a method, comprising:
measuring at least one pre-etch dimension and at least one post-etch dimension of at least one structure on the substrate; and
adjusting a process recipe of an etch process for etching the substrate and a process recipe of at least one pre-etch process and/or at least one post-etch process using the results of measuring the dimensions on the structures.
23. The computer-readable medium of claim 22, wherein the measuring step further comprises:
detecting a failure of processing equipment performing the at least one pre-etch process and/or the at least one post-etch process.

24. The computer-readable medium of claim 22, wherein the structures are elements of the integrated devices selected from a group consisting of a blanket layer, a featured layer, a film stack having at least one blanket layer and a film stack having at least one featured layer.
25. The computer-readable medium of claim 22, wherein the measuring step uses at least one in-situ measuring tool that is a component of an etch reactor performing the etch process.
26. The computer-readable medium of claim 22, wherein the measuring step uses at least one ex-situ measuring tool that is external to an etch reactor performing the etch process.
27. The computer-readable medium of claim 26, wherein the at least ex-situ one measuring tool and the etch reactor are modules of a processing system.
28. A method of controlling a process of fabricating integrated devices on a substrate comprising:
 obtaining process measurement data from a first substrate; and
 adjusting a process sequence in response to the process measurement data.
29. The method of claim 28, wherein the step of obtaining process measurement data further comprises measuring at least one of pre-etched or post-etched dimensions of a structure formed on the substrate.
30. The method of claim 28, wherein the adjusting step further comprises:
 adjusting a process sequence of the substrate associated with the process measurement data.
31. The method of claim 30, wherein the adjusting step further comprises:
 performing an unscheduled metrology step in response to the process measurement data.

32. The method of claim 30, wherein the step of adjusting the process sequence further comprises:

performing an unscheduled additional fabrication step.

33. The method of claim 28, wherein the step of adjusting the process sequence further comprises:

adjusting the process sequence of a wafer unassociated with the process measurement data.

34. The method of claim 33, wherein the step of adjusting the process sequence further comprises:

performing an unscheduled metrology step to the substrate unassociated with the process data in response to the obtained process measurement data.

35. The method of claim 33, wherein the step of adjusting the process sequence further comprises:

performing an unscheduled additional fabrication step to the substrate unassociated with the process data.

36. A method of controlling a process of fabricating integrated devices on a substrate comprising:

executing a multi-pass process, wherein the substrate is processed more than once by an etch process and at least one pre-etch process and/or at least one post-etch process while forming at least one structure on the substrate, where each time the substrate is processed by the etch process is a pass;

during each pass, measuring at least one pre-etch dimension and at least one post-etch dimension of at least one structure on the substrate; and

adjusting a process recipe of the etch process for etching the substrate and a process recipe of at least one pre-etch process and/or at least one post etch process using the results of measuring the dimensions on the structures.

37. The method of claim 36, wherein the measuring step further comprises:
detecting a failure of processing equipment performing the at least one pre-etch process and/or the at least one post-etch process.
38. The method of claim 36, wherein the structures are selected from a group consisting of a blanket layer, a featured layer, a film stack having at least one blanket layer and a film stack having at least one featured layer.
39. The method of claim 36, wherein the measuring step uses a non-destructive measuring technique.
40. The method of claim 36, wherein the measuring step uses at least one in-situ measuring tool that is a component of an etch reactor performing the etch process.
41. The method of claim 40, wherein the measuring step further comprises:
measuring thickness of the structures using the at least one in-situ measuring tool.
42. The method of claim 36, wherein the measuring step uses at least one ex-situ measuring tool that is external to an etch reactor performing the etch process.
43. The method of claim 42, wherein the measuring step further comprises:
measuring topographic dimensions and/or thickness of the structures using the at least ex-situ one measuring tool.
44. The method of claim 43, wherein the at least ex-situ one measuring tool and the etch reactor are modules of a processing system.
45. The method of claim 36, wherein the processing equipment is external to the processing system.

46. The method of claim 36, wherein the adjusting step further comprises:
adjusting the process recipe of an etch process for etching at least one subsequent substrate.
47. The method of claim 36, wherein the at least one pre-etch process is performed before measuring the pre-etch dimensions.
48. The method of claim 36, wherein the at least one post-etch process is performed after measuring the post-etch dimensions.
49. The method of claim 36, wherein the at least one pre-etch process and/or the at least one post-etch process is selected from a group consisting of a chemical mechanical polishing process, a deposition process, an etch process, an oxidation process, an annealing process and a lithographic process.
50. The method of claim 36, wherein the pre-etch measurements are taken in a device coupled to a processing system having a processing chamber in which the etch process is performed.
51. The method of claim 36, wherein the pre-etch measurements are taken in a device remove from a processing system having a processing chamber in which the etch process is preformed.
52. The method of claim 36, wherein the step of adjusting further comprises adjusting end point detection parameters.